TRICHOMYCETES OF JACKSON HOLE

Abdulaziz M. El-Buni and Stephen T. Moss,
Department of Botany, University of Kansas
and
Department of Plant Sciences, University of Reading,
Reading, Berkshire, England
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The Trichomycetes is a class of fungi found as endocommensals attached to the chitinous gut linings of a wide range of marine, freshwater and terrestrial arthropods. The relationship between fungus and host, the taxonomic affinities of the class and the geographical distribution of these fungi are points of current interest in our laboratory. The unique ecological niche of the trichomycetes and the present inability to culture all but two genera of the class have contributed to their general obscurity. A prerequisite for any investigation of the trichomycetes is a close proximity to suitable host habitats. Dr. Robert W. Lichtwardt, on previous visits to Jackson Hole Biological Research Station (1960, 1961, 1965, 1970) has indicated the presence of many trichomycete species in the Grand Teton National Park, several collection sites being the type localities of genera and species (Lichtwardt, R. W. 1972. Undescribed genera and species of Harpellales [Trichomycetes] from the guts of aquatic insects. Mycologia 64 (1): 167-197).

The class Trichomycetes contains the four orders: Amoebidiales, Eccrinales, Asellariales and Harpellales united by their common endocommensalic habit, presence of a holdfast and reproduction by production of sporangiospores. However, they represent a morphologically diverse group ranging from the unbranched, nonseptate, amoebae-producing Amoebidiales to the frequently highly branched, septate Harpellales which possess dehiscent appendaged sporangia termed trichospores. For the past two years one of us (Moss) has been studying the fine structure of the trichomycetes in order to clarify certain unique aspects of their morphology (spore-appendage formation, holdfast development, spore germination), and to elucidate any phylogenetic relationships within the four trichomycete orders and between these orders and other classes of fungi which may be indicated by their micromorphology.

The project was undertaken at the Jackson Hole Biological Research Station in July 1973 to collect, identify and embed material for future fine structural studies. Collection of hosts was restricted to those forms inhabiting freshwater streams and containing species of the Harpellales. The collection sites selected were: Third Creek; Creek draining Two Ocean Lake; Creek draining Emma Mathilda Lake. The species of trichomycetes collected were: Genistellospora homothallica, Simuliomyces microsporus and Pennella angustispora, all from Simulium spp. larvae; Glotzia ephemeridarum from the proctodaeum of Baetis tricaudatus; an undescribed species

of the Harpellales from the proctodaeum of Baetis sp. nymphs. Living hosts were dissected in the laboratory and the trichomycetes identified. Selected thalli were fixed in various mixtures and concentrations of glutaraldehyde, acrolein, osmium tetroxide and potassium permanganate; embedment of fixed and dehydrated fungal thalli was in an Epon/Araldite mixture. This material is at present receiving attention.

An attempt was made by Mr. El-Buni to culture several of the species collected on defined media. No sustained growth was obtained with any innoculation.

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